Space Weather Forecast

Issued on Monday, 29 August 2022 at 01:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate flares (R1-R2) likely at first. Minor Geomagnetic Storm likely with CME glance day 1. Chance of further Minor Radiation storms (S1).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate with further Moderate class flares observed from a large sunspot near the southwest limb. The largest flare from this region peaked at 28/1619 UTC and released a coronal mass ejection (CME) that is probably not Earth directed. A further sunspot group in the southeast, whilst less active, has seen some growth, with increased magnetic complexity. There are three other sunspot containing active regions, however these are all smaller, simpler and currently appear to be stable. No Earth-directed coronal mass ejections were observed occurring in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind was mostly at slightly elevated levels between 400 and 500 km/s due to the influence of fast winds from a coronal hole. The total interplanetary magnetic field was at weak to moderate levels. The important northwards-southwards direction remained weak. Geomagnetic activity was Quiet to Unsettled.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) declined erratically after a previous increase as a result of the Moderate-flaring of the large sunspot in the southwest. Following the large flare on 28 Aug readings at GEO remained below the minor radiation storm level.

Four-Day Space Weather Forecast Summary

Solar Activity: Further Moderate-class flares are likely with a slight chance of an isolated Strong flare. This risk will probably decrease through the period as the main sunspot in the southwest rotates off the disc, however the sunspot in the southeast will need to be monitored for any further development.

Solar Wind / Geomagnetic Activity: A moderately fast CME was generated from a long duration Moderate-flare of the sunspot in the southwest on the 27th. This has the potential to give a glancing arrival on day 1. Ongoing coronal hole fast wind enhancements are also probable over the next couple of days with the predicted elevated solar winds only gradually declining from day 3 (31st) onwards. Geomagnetic Activity is expected to be Quiet to Unsettle at first, with a chance of Active, and with G1/Minor Storms likely with a chance of G2/Moderate storms from any CME glance. Mainly Quiet geomagnetic conditions expected from day 3 (31st).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is currently below the S1 Minor Radiation Storm level and will probably continue to rise on day 1 in response to the large flare on 28 Aug. There remains a chance of further increases to or above the S1 level, due to any notable flares from the large sunspot located in the far

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southwest of the visible disc.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	60	20	1	1
Strong	G3	No	15	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	30	30	30
Very Active	R3 to R5 X	No	20	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	45	45	20	5
Very Active	≥ S3 *	No	10	5	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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